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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,050	07/24/2006	**Koji Kikushima**	6700-88843	9080

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FITCH EVEN TABIN AND FLANNERY
120 SOUTH LASALLE STREET
SUITE 1600
CHICAGO, IL 60603-3406

EXAMINER	
LIU, LI	

ART UNIT	PAPER NUMBER
2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/587,050	KIKUSHIMA ET AL.	
	Examiner	Art Unit	
	LI LIU	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 July 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/10/08, 7/24/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on March 17, 2004. It is noted, however, that applicant has not filed a certified copy of the JP 2004-076746 application as required by 35 U.S.C. 119(b).

Information Disclosure Statement

2. The information disclosure statements (IDS) submitted on 7/24/2006 and 12/10/2008 are being considered by the examiner.

Drawings

3. Figures 1-4 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 9 and 10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 9, and thus depending claim 10, recites the limitation “a modulation means for intensity-modulating an optical signal with RF signals of satellite broadcasting”. But, the specification does not provide the detailed description of the “modulation means” or intensity modulator that perform the “intensity-modulating”. In the specification, the applicant discloses "[t]he RF signals (11.7-12.8 GHz) of the multichannel satellite broadcasting, which are frequency-division multiplexed, are entered into the optical signal transmitter 10, and are transmitted as optical signals, which are intensity-modulated by a semiconductor laser 12 and the like.” (page 10, [0023]). It is known in the art that the semiconductor laser itself is not an optical modulator; the specification does not disclose how the semiconductor laser intensity-modulates the “optical signals”. If the semiconductor laser is a directly-modulated laser, a laser driver should be used to drive the laser with data signals so that the laser can output "intensity modulated" optical signal (that is, the laser is modulated). If the semiconductor laser is not a

directly-modulated laser, an external modulator must be used to modulate the light outputted from the laser. The specification also does not clearly disclose a modulator; and the specification also does not disclose whether a directly-modulated laser is used and what kind of directly-modulated laser is used to accept the high frequency signal (11.7-12.8 GHz). The specification fails to disclose sufficient structure to perform the claimed function "intensity-modulating". The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

6. Claims 9 and 10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 9, and thus the depending claim 10, is rejected under 112, 1st paragraph as being a single means claim, i.e., where a means (a modulation means or a modulator) recitation does not appear in combination with another recited element of means, with undue breadth. *In re Hyatt*, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983). A single means claim which covered every conceivable means for achieving the stated purpose was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor. See MPEP §2164.08(a).

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 9 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim element "modulation means for intensity-modulating an optical signal with RF signals of satellite broadcasting" is a means plus function limitation that invokes 35 U.S.C. 112, sixth paragraph. However, the written description fails to disclose the corresponding structure, material, or acts for the claimed function.

In the specification, the applicant discloses "[t]he RF signals (11.7-12.8 GHz) of the multichannel satellite broadcasting, which are frequency-division multiplexed, are entered into the optical signal transmitter 10, and are transmitted as optical signals, which are intensity-modulated by a semiconductor laser 12 and the like." (page 10, [0023]). It is known in the art that the semiconductor laser itself is not an optical modulator; the specification does not provide the detailed explanations of the "semiconductor laser" that can perform the "intensity-modulating". If the semiconductor laser is a directly-modulated laser, a laser driver should be used to drive the laser with data signals (that is, the laser is modulated). If the semiconductor laser is not a directly-modulated laser, an external modulator must be used to modulate the light outputted from the laser; the specification does not clearly disclose a modulator either. That is, the specification fails to disclose the corresponding structure, material, or acts for the claimed function.

Applicant is required to:

(a) Amend the claim so that the claim limitation will no longer be a means (or step) plus function limitation under 35 U.S.C. 112, sixth paragraph; or

(b) Amend the written description of the specification such that it expressly recites what structure, material, or acts perform the claimed function without introducing any new matter (35 U.S.C. 132(a)).

If applicant is of the opinion that the written description of the specification already implicitly or inherently discloses the corresponding structure, material, or acts so that one of ordinary skill in the art would recognize what structure, material, or acts perform the claimed function, applicant is required to clarify the record by either:

(a) Amending the written description of the specification such that it expressly recites the corresponding structure, material, or acts for performing the claimed function and clearly links or associates the structure, material, or acts to the claimed function, without introducing any new matter (35 U.S.C. 132(a)); or

(b) Stating on the record what the corresponding structure, material, or acts, which are implicitly or inherently set forth in the written description of the specification, perform the claimed function. For more information, see 37 CFR 1.75(d) and MPEP §§ 608.01(o) and 2181.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsuchiya et al (JP 04-280521, the English translation of JP04-280521).

1). With regard to claim 1, Tsuchiya et al discloses an optical signal receiver comprising:

an optical-receiving means for receiving an optical signal (Figure 1, the optical receiver including O/E converter 31, High Pass Filter 32, frequency converter 33/34, Low Pass Filter 35 and amplifier 36; this optical receiver receives optical signal from the fiber 21 and converts the optical signal into electrical signal, and outputs frequency converted electrical signal), the optical signal being intensity-modulated with high frequency electric signals ([0004], [0005], [0007]; the optical signal outputted from the E/O converter 15 is the optical signal driven by AM-FDM (amplitude modulated, also called intensity-modulated, frequency division multiplex) electrical signals, the electrical signal has high frequency, 490 MHz ~ 868 MHz, [0015]),

a photoelectric-converting means (the O/E converter 31 in Figure 1) for converting the optical signal received by the optical-receiving means to electric signals ([0016], the O/E converter 31 converts the received optical signal into an electric signal); and

a frequency-converting means (the frequency converter 33/34 combined with the low pass filter 35, Figure 1) for converting the electric signals converted by the photoelectric converting means to lower frequencies ([0016], the frequency converter 33/34 and low pass filter 35 output a lower frequency signals, 90 MHz ~ 468 MHz).

2). With regard to claim 3, Tsuchiya et al further discloses wherein the high frequency electric signals are frequency-division multiplexed electric signals ([0004], [0005], [0007]; the high frequency electric signals are AM-FDM, amplitude modulated frequency division multiplex electrical signals).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 2 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuchiya et al (JP 04-280521, the English translation of JP04-280521) in view of Kuri et al (US 2001/0055137).

1). With regard to claim 2, Tsuchiya discloses all of the subject matter as applied to claim 1 above. But, Tsuchiya et al does not expressly disclose wherein the high frequency electric signals are in a microwave frequency band or in a millimeter wave frequency band.

However, to use an optical transmitter to transmit high frequency signal is known in the art. Kuri et al teaches a system and method (e.g., Figure 1) in which a high frequency RF signal in a millimeter wave frequency band (202 in Figure 1, the high frequency signal has a subcarrier frequency 59.6 GHz, [0036], which is in the millimeter wave frequency band) is transmitted optically by driving the optical intensity-modulator (the intensity modulator 203 in Figure 1); the optical signal is transmitted via fiber (206 in Figure 1) to the receiver (207/221 in Figure 1); and after the O/E converter by photodetector 207, the high frequency signal is down-converted to a intermediate frequency outputted from the processing circuit 221.

Kuri et al teaches to transmit high frequency signals. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the high frequency optical transmitter as taught by Kuri et al to the system of Tsuchiya et al so that the system can be used for high frequency signal transmission, and the system capacity can be increased.

2). With regard to claim 11, Tsuchiya and Kuri et al disclose all of the subject matter as applied to claims 1 and 2 above. And Tsuchiya et al further discloses wherein the high frequency electric signals are frequency-division multiplexed electric signals ([0004], [0005], [0007]; the high frequency electric signals are AM-FDM, amplitude modulated frequency division multiplex electrical signals).

13. Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuchiya et al (JP 04-280521, the English translation of JP04-280521) in view of

Applicant admitted prior art (the AAPA: e.g., Figure 1, pages 1-4) and Farber et al (US 6,486,907).

1). With regard to claims 4-7, Tsuchiya discloses all of the subject matter as applied to claim 1 above. But, Tsuchiya et al does not expressly disclose wherein the high frequency electric signals are RF signals of satellite broadcasting, and wherein the electric signals converted by the frequency-converting means are IF signals of the satellite broadcasting; and wherein the RF signals are in a frequency range from about 11.7 GHz to 12.8 GHz, and wherein the IF signals are in a frequency range from about 1.0 GHz to 2.1 GHz.

However, the AAPA discloses a video transmission system (Figure 1) which receive RF signals of satellite broadcasting in a frequency range from about 11.7 GHz to 12.8 GHz (page 3, lines 6-8); and the RF signal is down-converted in the antenna to an intermediate frequency (IF) signals of 1.0-2.1 GHz; and a optical transmitter (10 in Figure 1) is used to transmit the IF signals to the receiver (50 in Figure 5) via optical fiber (20 in Figure 1), and then the converted electrical signal is sent to the set-top box STB via coaxial cable (60 in Figure 1).

By using the optical fiber, the transmission distance can be increased. But, in the AAPA's system, the RF signal is down-converted in the satellite antenna, not in the receiver.

However, Farber et al discloses that the satellite signal often can be combined with the UHF/VHF/CATV etc other frequency signals (e.g., Figure 9, the satellite signal from the AGC 72 and the UHF/VHF/CATV signal from AGC 204 are combined by

diplexer 206). It is noticed that the UHF can be as high as 3 GHz. When the UHF signal is around 1-3 GHz, it will conflict with the down-converted IF satellite signal. However, Tsuchiya et al already teaches that the high frequency signal can be down-converted at the optical receiver. Also, it is well known that the transmission loss in a coaxial cable is increasing as the frequency increases. Then, one skilled in the art will be motivated to optically transmit the original RF satellite signal of 11.7 GHz to 12.8 GHz so to save lower frequency bands for other non-satellite signal bands, and then at the optical receiver a frequency down converter is used to down-convert the original RF signal to IF signal of 1.0-2.1 GHz (to reduce the transmission loss in coaxial cable and also for consistent with the set-top box) and then sent via coaxial cable to the set-top box for demodulating.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the satellite signal transmission as well as the UHF/VHF/CATV non-satellite signals transmission as taught by the AAPA and Farber et al with the system/method of Tsuchiya et al so that an original RF satellite signal can be transmitted optically and down-converted in the optical receiver and then sent to the set-top box via coaxial cable, and the system capacity can be increased and transmission loss is reduced.

2). With regard to claim 8 (dependent on any one of claims 4-7), Tsuchiya and the AAPA and Farber et al disclose all of the subject matter as applied to claims 1 and 4-7 above. And the combination of Tsuchiya and the AAPA and Farber et al further disclose the optical signal receiver further comprising a transmission means for

transmitting via a coaxial cable the electric signals converted to the lower frequencies by the frequency-converting means (the combination of Tsuchiya and the AAPA and Farber et al teaches a down-converter in the optical receiver; and in Figure 1, the AAPA teaches that the optical receiver 30 transmits the converted IF electric signal to the set-top box via a coaxial cable 60. And in Figures 1, 6 and 9 etc of Farber, the optical receiver or the "satellite signal receive and distribution unit", 16 in Figure 1, transmits IF electric signal to the satellite receiver, 28 in Figure 1, via a coaxial cable; also refer to Figure 7. That is, the combination of Tsuchiya and the AAPA and Farber et al teaches a transmission means for transmitting via a coaxial cable the electric signals converted to the lower frequencies by the frequency-converting means).

14. Claim 8 (dependent on claims 1 or 3) is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuchiya et al (JP 04-280521, the English translation of JP04-280521) in view of Applicant admitted prior art (the AAPA: e.g., Figure 1, pages 1-4).

Tsuchiya et al disclose all of the subject matter as applied to claims 1 and 3 above. And Tsuchiya et al teaches that the optical receiver converts the high frequency signals to the lower frequency signals. And Tsuchiya discloses that the signals are for coaxial CATV. But, Tsuchiya et al does not expressly state that the converted lower frequency signal (36 in Figure 1, after the amplifier) is sent out via a coaxial cable.

However, the AAPA discloses a video transmission system (Figure 1) which receive RF signals of satellite broadcasting (the RF signal is down-converted in the antenna to an intermediate frequency); and a optical transmitter (10 in Figure 1) is used to transmit the signals to the receiver (50 in Figure 5) via optical fiber (20 in Figure 1),

and then the recovered IF electrical signal is sent to the set-top box STB via coaxial cable (60 in Figure 1). The AAPA teaches that the optical receiver 30 transmits the IF electric signals via a coaxial cable.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the electric signal transmission by coaxial cable as taught by the AAPA to the system/method of Tsuchiya et al so that the down-converted signals can be sent to the conventional users, and the conventional set-top box can demultiplex the electric signal.

15. Claim 8 (dependent on claim 2) is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuchiya et al and Kuri et al as applied to claims 1 and 2 above, and in further view of Applicant admitted prior art (the AAPA: e.g., Figure 1, pages 1-4).

Tsuchiya et al and Kuri et al disclose all of the subject matter as applied to claims 1 and 2 above. And Tsuchiya et al teaches that the optical receiver converts the high frequency signals to the lower frequency signals. And Tsuchiya discloses that the signals are for coaxial CATV. But, Tsuchiya et al does not expressly state that the converted lower frequency signal (36 in Figure 1, after the amplifier) is sent out via a coaxial cable.

However, the AAPA discloses a video transmission system (Figure 1) which receive RF signals of satellite broadcasting (the RF signal is down-converted in the antenna to an intermediate frequency); and a optical transmitter (10 in Figure 1) is used to transmit the signals to the receiver (50 in Figure 5) via optical fiber (20 in Figure 1), and then the recovered IF electrical signal is sent to the set-top box STB via coaxial

cable (60 in Figure 1). The AAPA teaches that the optical receiver 30 transmits via a coaxial cable the IF electric signals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the signal transmission by coaxial cable as taught by the AAPA to the system/method of Tsuchiya et al and Kuri et al so that the down-converted signals can be sent to the conventional users, and the conventional set-top box can demultiplex the electric signal.

16. Claims 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuchiya et al and Kuri et al as applied to claims 1, 2 and 11 above, and in further view of Applicant admitted prior art (the AAPA: e.g., Figure 1, pages 1-4).

Tsuchiya et al and Kuri et al disclose all of the subject matter as applied to claims 1, 2 and 11 above. And Tsuchiya et al teaches that the optical receiver converts the high frequency signals to the lower frequency signals. And Tsuchiya discloses that the signals are for coaxial CATV. But, Tsuchiya et al does not expressly state that the converted lower frequency signal (36 in Figure 1, after the amplifier) is sent out via a coaxial cable.

However, the AAPA discloses a video transmission system (Figure 1) which receive RF signals of satellite broadcasting (the RF signal is down-converted in the antenna to an intermediate frequency); and a optical transmitter (10 in Figure 1) is used to transmit the signals to the receiver (50 in Figure 5) via optical fiber (20 in Figure 1), and then the recovered IF electrical signal is sent to the set-top box STB via coaxial

cable (60 in Figure 1). The AAPA teaches that the optical receiver 30 transmits via a coaxial cable the IF electric signals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the signal transmission by coaxial cable as taught by the AAPA to the system/method of Tsuchiya et al and Kuri et al so that the down-converted signals can be sent to the conventional users, and the conventional set-top box can demultiplex the electric signal.

17. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuri et al (US 2001/0055137) in view of Farber et al (US 6,486,907).

Kuri et al discloses an optical signal transmitter (Figure 1, 201 and 203) comprising a modulation means (e.g., the intensity modulator 203 in Figure 1) for intensity-modulating an optical signal (the optical signal from the light source 201) with RF signals (the signals from the RF signal source 202).

But, Kuri does not expressly state that the RF signals are the RF signals of satellite broadcasting.

However, Farber et al discloses a satellite signal distribution system including a headend which includes a fiberoptic transmitter that combines satellite signals from a satellite antenna with non-satellite television signals (Figures 1, 6, 5 and 9 etc.); and the RF (e.g., the L-band) signals of satellite broadcasting modulates the laser diode, and the intensity modulated optical signal (e.g., Figures 4 and 5) is outputted from the transmitter (e.g., Figure 5, modulated optical signal is outputted from laser diode 82).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the optical transmission of satellite signal as taught by Farber et al to the system of Kuri so that the system can be used to transmit the high frequency RF satellite signals, and a high capacity satellite transmission and distribution system can be obtained.

18. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuri et al and Farber et al as applied to claim 10 above, and in further view of Tsuchiya et al (JP 04-280521, the English translation of JP04-280521).

Kuri et al and Farber et al disclose all of the subject matter as applied to claim 9 above. But Kuri et al and Farber et al do not expressly disclose wherein the RF signals are in a frequency range from about 11.7 GHz to 12.8 GHz.

The combination of Kuri et al and Farber et al discloses that an optical transmitter can be used to transmit RF satellite broadcasting signal by an optical intensity modulator. And Farber et al teaches that the satellite signal can be Ku band signal (column 1, line 22-23; note: the Ku band has the frequency range around ~11 GHz to 12.8 GHz). But, in Farber's system, the high frequency signal is down-converted into L-band in the antenna, and the laser diode is modulated with the L-band signal. However, Farber et al also discloses that the satellite signal can be combined with the UHF/VHF/CATV etc non-satellite signals (e.g., Figure 9, the satellite signal from the AGC 72 and the UHF/VHF/CATV signal from AGC 204 are combined by diplexer 206). It is noticed that the UHF can be as high as 3 GHz. When the UHF signal is around 1-3 GHz, it will conflict with the down-converted IF satellite signal.

However, another prior art, Tsuchiya et al, teaches that the high frequency signal can be down-converted at the optical receiver (Figure 1, [0016], in the optical receiver 31-35; the frequency converter 33/34 and low pass filter 35 output a lower frequency signals). Also, it is well known that the transmission loss in a coaxial cable increases as the frequency increases. Then, one skilled in the art will be motivated to optically transmit the original RF satellite signal of 11.7 GHz to 12.8 GHz so to save lower frequency bands for other non-satellite signals, and then at the optical receiver a frequency down converter is used to down-convert the original RF signal to IF signal of 1.0-2.1 GHz (to reduce the transmission loss in a coaxial cable and also for consistent with the set-top box).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the frequency down-converter in the optical receiver as taught by Tsuchiya et al to the system of Kuri et al and Farber et al so that an original RF satellite signal of 11.7 GHz to 12.8 GHz can be directly and optically transmitted and down-converted in the optical receiver, and the lower frequency bands can be saved for other non-satellite signals, and the system capacity can be increased.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Miller et al (US 4,545,075) (Figure 2);

Weber et al (US 5,995,258) (Figures 1 and 5);

Olshansky et al (US 4,941,208) (Figure 1).

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LI LIU whose telephone number is (571)270-1084. The examiner can normally be reached on Monday-Friday, 8:30 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Li Liu/
Examiner, Art Unit 2613
February 6, 2009